

***Spergularia bocconeii* (Scheele) Merino, Boccone's Sand Spurrey, and
Spergula arvensis, Spurry, (Caryophyllaceae)**

Description. Annual, mat- to mound-like, 8-20 cm wide, from a tap root; stems spreading to prostrate, branched, glabrous to somewhat glandular. Leaves opposite, 10-20 mm long, linear, entire, somewhat succulent, glabrous, apices acute; stipules 2-4 mm long, triangular, acuminate. Flowers generally in terminal, somewhat one-sided clusters, sometimes axillary, pedicels often minutely glandular; sepals five, 2-4 mm long, lanceolate to ovate, fused into a short tube at base, lobe margins scarious; petals 5, shorter than sepals, pinkish to white; stamens (6)8-10; ovary superior, with a 3-lobed style. Fruit a capsule; seeds several, surface rugose to papillose, brown. In California, flowering from March to July. (Abrams 1944, Clapham et al. 1962, Hartman 1993, Monnier and Ratter 1964, Munz 1959).

Spergularia villosa (villous sand spurrey), another alien species, is a perennial with viscid-glandular stems, filiform cauline leaves, axillary clusters of 2-4 leaves, and black, prominently winged seeds (Abrams 1944, Hartman 1993). *Spergula arvensis* (spurry), differs from *Spergularia* by apparently whorled leaves, composed of dense axillary fascicles of 8-15 leaves, and an ovary with 5 style branches. The petals are ovate and \pm equal to the sepals (Clapham et al. 1962, Fernald 1950, Hartman 1993, Larson 1986, Monnier and Ratter 1964).

Geographic distribution. *Spergularia bocconeii*, a native of Europe, is naturalized in California and southern Oregon, Australia, New Zealand, and southern Africa (Arnold and de Wet 1993, Chapman 1991, Hartman 1993, Webb et al. 1988). *Spergularia villosa* is a native of South America and apparently naturalized only in California and southern Oregon (Hartman 1993, Munz 1959). *Spergula arvensis*, a native of Europe, is naturalized throughout North America, Chile, Australia, New Zealand, Japan, southern Africa, and Hawaii (Arnold and de Wet 1993, Chapman 1991, Gleason and Cronquist 1991, Larson 1986, Montenegro et al. 1991, Ohwi 1965, Wagner et al. 1990, Webb et al. 1988).

Spergula arvensis was reported from central California (Mount Diablo) as early as 1865 by Brewer et al. (1876), but the earliest records of *Spergularia bocconeii* and *S. villosa* are unclear, perhaps as a result of early taxonomic confusion with other *Spergularia* species. Consequently, *Spergularia bocconeii* was not recognized as occurring in California until Munz (1959), but it may have been collected and reported under earlier names (Jepson 1925). *Spergularia villosa* (as *S. clevelandii*) was first recognized in California (San Francisco, near San Diego) by Jepson (1914), where it had become established by the late 19th century.

Spergularia bocconeii occurs on Anacapa, Santa Barbara, and Santa Cruz islands. *Spergularia villosa* and *Spergula arvensis* are known from Santa Rosa Island (Junak et al. 1997). Both species of *Spergularia* occur in the coastal counties and the Great Central Valley. *Spergula arvensis* is widespread in most coastal counties (Anonymous 1998, Hartman 1993).

Reproductive and vegetative biology. No literature was found on the reproductive or vegetative biology of *Spergularia*. However, other members of Caryophyllaceae, with similar flowers, are generally self-compatible and pollinated by small insects (Proctor et al. 1996, Richards 1986).

Spergula arvensis is primarily autogamous and thus largely self-pollinated (New 1959, Richards 1986). Each capsule produces from 5 to 25 seeds and individual plants may produce up

to 7,500 seeds. In cultivated fields infested by *Spergula*, densities of 4 to 23 million seeds per hectare have been reported (Champness and Morris 1948, Roberts 1958). Seeds of *Spergula arvensis* have been reported to remain viable for as long as 1,600 years (Odum 1965). It also has a seed coat polymorphism that is correlated with different patterns of germination (New 1958, 1961). Papillate seeds germinate at higher rates than smooth seeds at 21 degrees C, but less so at lower temperatures.

Seed dimorphism similar to *S. villosa* has been studied in *S. marina* and *S. media* (Sterk 1969, Sterk and Dijkhuizen 1972). In both of them, winged seeds are advantageous over unwinged seeds with respect to dispersability.

Ecological distribution. Species of *Spergularia* occur on disturbed sites, beach dunes, and frequently occur on alkaline soils (Wagner et al. 1990, Webb et al. 1988). Although similar with respect to disturbance preferences, *Spergula arvensis* also tends to occur on acidic, vernal moist soils (Clapham et al. 1962).

Weed status. Neither species of *Spergularia* are considered noxious weeds in agricultural or horticultural practice, at least at a global level (not listed by Holm et al. 1977), nor are they considered noxious by the State Dept. of Food and Agriculture (Anonymous 1996). Neither species are listed by Lorenzi and Jeffery (1987). However, *Spergula arvensis* is considered a noxious weed in Holm et al. (1977), and is listed for the United States by Lorenzi and Jeffery (1987). In Britain it is considered rare and local, primarily in coastal areas (Clapham et al. 1962).

Microbial and insect pathogens. No literature was found that reported microbial or insect pathogens of either *Spergularia* or *Spergula*.

Herbicide control. No literature was found that reported herbicide control of *Spergularia*. Lorenzi and Jeffery (1987) recommend dicamba or paraquat for the control of *Spergula arvensis*.

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